Hay-Zama Wildland Park Management Plan

Alberta Community Development
Parks and Protected Areas
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Copies of this management plan are available from

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Ken Lumbis, Ducks Unlimited

Preface

The Hay-Zama Wildland Park management plan provides a long-term vision and day-to-day guidance for stewardship of the Hay-Zama Wildland Park. The plan was prepared by department staff, within the context of existing legislation and regulations. It outlines the type and extent of outdoor recreation and tourism opportunities, facilities and services. The plan provides direction regarding the delivery of heritage appreciation programs that assist Albertans and visitors to understand and appreciate our natural heritage while ensuring its ongoing preservation.

The management plan was developed with public input and is intended to provide for periodic review and revision to reflect the current thinking of Albertans on how our natural heritage will be preserved for present and future generations.

The Minister responsible for parks and protected areas has authorized the implementation of the management plan and retains the authority to amend or interpret its provisions.

Acknowledgements

The following are members of the Hay-Zama Committee. Initially established in the 1980s, and reconvened in 1994, this committee has worked to balance the cultural, environmental and economic realities of the Hay-Zama complex. The committee received an Emerald Award in 1996 in recognition of its accomplishments.

Brian Olson, Albert Energy and Utility Board (AEUB)
Charlie Chambaud, Dene Tha' First Nation
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William Bradley, Crispin Energy

The following are former members of the Hay-Zama Committee who helped shape it.

Bill Harlan, Canadian Association of Petroleum Producers
Bill Tinge, Lands and Forest Service
Bob Weir, Mobil Oil
Bruce Auld, AEUB
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Dennis Halliday, Land and Forest Service
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Phil Tsui, Mobil Oil
Richard Lewanski, Amber Energy
Tim Zelter, Imperial Oil
Vern Neal, Land and Forest Service
Wayne Norstrom. Fish and Wildlife Division

The following are given special acknowledgement for their work in the Hay-Zama Committee.

Cliff Wallis, Chief James Ahnassay, Ken Lumbis and James Broughton who negotiated the MOU and Addendum 1 on behalf of the Hay-Zama Committee.

Navigo Energy Inc. (formerly Ventus Energy), and Crispin Energy Inc. for their commitment to the principles of ID 96-1 and the concepts developed in the MOUs and Addendum 1. Their support has been a major factor in the achievements of the Hay-Zama Committee.

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1.0 Introduction

1.1 Location

Hay-Zama Wildland Park is located in northwestern Alberta and is 486 square kilometers in size. Its eastern boundary is about 110 kilometers west of High Level in northwestern Alberta. Three Dene Tha' Indian Reserves (I.R.) share part of its boundary - Hay Lake I.R. 209 on the east, Zama I.R. 210 on the west, and Amber River I.R 211 on the north. The park is part of the traditional hunting, fishing and trapping territory of the Dene Tha' First Nation.

The park is a large wetland complex of shallow lakes and meandering rivers. Several rivers and creeks drain into it. The Hay River is the only one that flows through the entire complex, entering from the west and flowing to the northeast. The wetland complex is surrounded by forested uplands, with Zama Ridge to the south providing the most relief in the region.

The wetland complex sits above an oil and gas reserve that has been tapped since the 1960s. Since 1994 the Hay-Zama Committee, composed of representatives from government, industry, First Nations and the environment, has guided oil and gas development in the park.

1.2 Significance of the wetland complex

The Hay-Zama wetland complex has been recognized for its ecological values for many years by the aboriginal people who live there, and by agencies whose mandate is conservation and management of areas of ecological importance.

Dene Tha' Traditional Use

The Dene Tha' First Nation has long used the wetland complex for their traditional hunting, fishing and trapping activities that extended from northwestern Alberta and northeastern British Columbia into the southern regions of the Northwest Territories. As their nomadic way of life changed, the Dene Tha' began to establish small settlements, then gradually moved to Habay in the 1950s, and then to Chateh in 1962 because of floods. These communities are within Hay Lake Indian Reserve 209, which is adjacent to the east boundary of the park.

Ducks Unlimited Involvement

Ducks Unlimited has been involved in the management of the wetland complex since 1939, when the province passed an Order-in-Council (OC) giving them authority to manage the wetland complex for waterfowl habitat. The Order-in-Council was amended in 1958 to include the Water Resources Branch of the government in the management of the complex. The aim was to protect the wildlife habitat by stabilizing water levels and controlling industrial development. Amendments to the OC in 1960 and 1968 clarified land descriptions and excluded the Indian Reserves from the management area. In 1968 the Dene Tha' band council passed a resolution to cooperate with Ducks Unlimited in the management of the wetland.

In 1985, Hay-Zama was one of 20 key provincial wetlands selected for active management in the joint Ducks Unlimited/Alberta government "Wetlands for Tomorrow" initiative. Attempts to manage the hydrology of the complex proved too costly, and by 1997 Ducks Unlimited had removed any water structures to allow the wetland complex to function as a natural system without interference.

Rge 9 Rge 8 Rge 7 Rge 6 Rge 5 Rge 4

Twp 114

Twp 113

Twp 112

Hay Lake

North Zama Lake

Zama Lake

Buck Lake

Sand Lake

Chateh

Twp 114

Twp 113

Twp 112

Rge 9 Rge 8 Rge 7 Rge 6 Rge 5 Rge 4

Hay-Zama Wildland Park

Scale 1:150000

April 2001

Map produced by the Resource Information Unit - Land & Forest Service NWB

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

Legend

Wetland of International Importance - Ramsar Site
The Hay-Zama complex received international recognition through its designation as a Wetland of International Importance in 1982. This designation was given by the Ramsar Convention on Wetlands, an international treaty that provides the framework for national action and international cooperation for the conservation of wetlands and their resources. This designation obliges wise use[1] of a site, and brings increased publicity and international prestige for the wetlands.

Bison Management Area
The Hay-Zama wetland area is habitat for the only re-introduced herd of wood bison in Alberta. The wetland provides critical winter forage for the bison, an endangered species according to the Wildlife Act, and the herd has thrived since their arrival in 1984. The free-ranging herd is protected from hunting within the Bison Management Area, which covers a large part of northwestern Alberta including Hay-Zama.

Designation as Wildland Park
Hay-Zama Wildland Park was established in 1999. Its designation as a wildland park provides legislated protection to an important wetland and waterfowl habitat, and adds it to Alberta's network of protected areas.

1.3 Public participation

The management plan was initiated by Parks and Protected Areas and by the Hay-Zama Committee in the spring of 2001. A Terms of Reference was prepared by Parks and Protected Areas and presented to the Dene Tha' council in April and to the Hay-Zama Committee in May. This was followed by an open house in June at Chateh to discuss with the Dene Tha' band the Terms of Reference and issues arising from it.

A draft plan was prepared and presented to the Dene Tha' council in August. Through the co-chair of the Hay-Zama Committee, the three energy companies which have holdings in the complex were consulted throughout the summer for their input into the plan.

After revisions and review, the plan was endorsed by the Hay-Zama committee in October. An open house was held in High Level in November, after which the plan will be sent to Alberta Community Development for official approval by the Assistant Deputy Minister.

1.4 Purpose of Management Plan

Parks and Protected Areas policy states that each protected area requires a management plan. This plan provides direction for the management of Hay-Zama Wildland Park. Specifically, it:

- Describes the park;
- Places it in the context of Alberta's network of protected areas;
- Outlines management objectives and guidelines for its use and protection; and
- Discusses roles and responsibilities of agencies involved in the park.

2.0 Role in Alberta's Network of Protected Areas

Hay-Zama Wildland Park is part of a network of protected areas in Alberta. This section describes the framework on which the network is based, and the role of Hay-Zama Wildland Park in it.

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[1] The wise use of wetlands is their sustainable utilization for the benefit of mankind in a way compatible with the maintenance of the natural properties of the ecosystem. Sustainable utilization" of a wetland is defined as:"Human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations." (http://www.ramsar.org)

2.1 Natural Regions Framework

The Alberta government is committed to protecting the natural diversity of Alberta. To help select which areas of Alberta should be protected, a framework based on natural features has been adopted. This framework is a hierarchy of natural regions, subregions, and natural history themes. Natural regions provide the "big picture" of Alberta's landscapes, such as grasslands, mountains, and boreal forest. The subregions and natural history themes are subdivisions of the natural regions, and provide a more specific picture of smaller areas.

There are six Natural Regions in Alberta. Differences between these regions are readily apparent by their distinct landform features and vegetation.

Each of these Natural Regions has been divided into subregions based on criteria that vary depending on the Natural Region. The Boreal Forest Natural Region is divided into six subregions based on vegetation, geology and landforms.

Subregions are further divided into Level 1, Level 2 and Level 3 Natural History Themes. Level 1 themes are based on easily observed landforms of subregions, such as wetlands and valley/ridges.

Natural History Themes Hay-Zama Wildland Park	
Boreal Forest Natural Region Wetland Mixedwood Subregion	
Level 1 Theme	Level 2 Theme
Valley-Ridge/Floor Stream	Aspen River/creek Muskeg stream
Wetland - organic	Bog Fen Black spruce Shrub Graminoids
Wetland – mineral	Shrub
Wetland – lake	Eutrophic

Level 2 themes are more specific breakdowns of Level 1 themes. They refer to distinctive vegetation, habitat types or highly visible geological features. Examples of Level 2 themes for organic wetlands in the Wetland Mixedwood subregion are patterned and non-patterned fens, black spruce fens, and bogs. Level 3 themes are finer breakdowns of Level 2 themes. They include specific features such as rare plants and animals, and specific landform types.

Hay-Zama Wildland Park is in the Wetland Mixedwood subregion. Level 1 and Level 2 natural history themes and subthemes represented in the park are in the following table.

2.2 Parks and Protected Area Classification

Protected area legislation makes provision for seven classes of protected areas:

- Ecological Reserves
- Wilderness Areas
- Wildland Parks
- Provincial Parks
- Natural Areas
- Provincial Recreation Areas
- Heritage Rangelands

Each of these classes of protected areas contributes differently to the four goals of preservation, heritage appreciation, outdoor recreation and heritage tourism.

2.3 Purpose and Goals for Wildland Parks

Purpose

Wildland parks preserve and protect natural heritage, while providing opportunities for backcountry recreation and the experiencing of nature in an undisturbed state.

Wildland parks are large, undeveloped, usually remote natural landscapes that retain their primeval character without human habitation. Recreation facilities in wildlands are very limited, perhaps trails and backcountry campsites, with auto access confined to the periphery. Wildland parks provide significant tourism opportunities for nature-based recreation and tourism activities.

Goals

The goals of a wildland park reflect balancing the preservation of the ecological integrity of natural landscapes and ecological processes, along with associated biological diversity, with providing opportunities for backcountry recreation.

Preservation: Preserves and protects significant wildland landscapes and associated ecological processes and biological diversity.

Heritage Appreciation: Provides opportunities for exploration and appreciation of the wilderness heritage of Alberta.

Outdoor Recreation: Provide opportunities for wilderness travel and backcountry camping where recreational experiences are characterized by solitude, challenge and personal interaction with the natural environment.

Heritage Tourism: Provide unspoiled natural landscape for nature based touring, guiding and outfitting opportunities.

2.4 Guiding Principles for Management of Parks and Protected Areas

Ecological Sustainability – Alberta's parks and protected areas will be managed to preserve environmental diversity and ecological integrity through perpetuation of species, biological diversity and the unimpeded functioning of ecological systems and processes.

Ecosystem Management –A park or protected area is part of a larger ecosystem. Management of the natural resources in a park will be coordinated with the management of adjacent lands.

Balancing Preservation and Use – The parks and protected areas network will be managed to balance preservation and use. Different classes of protected areas accommodate varying degrees of human activities including outdoor recreation, based upon the degree of protection required for the areas' natural resources.

Environmental Stewardship – Heritage appreciation services facilitate public awareness and understanding of Alberta's natural heritage, as well as the sharing of that knowledge to foster positive attitudes and actions towards our natural heritage and its preservation.

Shared Responsibility - The Government of Alberta recognizes that stewardship of parks and protected areas is a shared responsibility. Partnerships that foster stewardship will be promoted with the private sector, other departments and governments, First Nations, volunteers, not for profit groups and individual citizens in the planning, management and operations of parks and protected areas.

3.0 A Place for Nature

The Hay-Zama wetlands complex consists of several rivers, creeks and ephemeral lakes in a shallow basin that covers 48, 600 hectares. The wetlands are situated on 3 major waterfowl migration flyways, and are an essential staging and nesting area.

Bedrock geology of the Hay-Zama area has not been studied in detail (Bentz et.al. 1994), but most of northwestern Alberta is comprised of the Shaftesbury formation (grey silty fish-scale bearing shale) of

Upper and Lower Cretaceous marine origin. The entire area was covered with the Keewatin ice sheet during the last glaciation. Hay-Zama wetland is likely a remnant of the lakes created by the melting of the ice as this glacier receded.

Detailed natural history descriptions can be found in Bentz et.al. 1994 and Wallis 1995.

3.1 Aquatic ecosystem

The Hay River is the only stable water channel and the major drainage of the wetland, and is separated from the lakes by high levees. Other rivers and streams draining into the wetlands include Sousa Creek and Mega, Omega, Vardie, Amber and Zama Rivers.

Lakes and ponds include Hay, West Hay, Zama, North Zama, Duck, Swan, and Sand Lakes. All the lakes are very shallow and transient, resulting in large zones with extensive emergent vegetation and limited zones of deeper water.

A unique feature of the wetlands is the fluctuating nature of the water levels, both seasonally and from year to year. The wetland is flooded when high water levels on the Chinchaga River result in back-flooding of the Hay River and subsequently the entire complex. The Chinchaga River joins the Hay River to the east of the complex.

The main concern is that the wetlands remain sustainable so they can support the wildlife that depend on them.

Objective

- *To allow natural water regimes to continue without interference.*

Management Actions

There will be no intensive management of the water regime in the complex, for instance structures to control water levels. Natural processes, including cycles of flood and drought, have maintained it in the past, and these processes will be allowed to continue.

Some stream banks and streambeds have been breached by industrial use, and natural water flow has been disrupted. These areas will be identified, and the feasibility of restoration investigated.

Permanent recording stations were installed on Duck Lake and North Zama Lake in 1988 to monitor water levels. These stations have since been removed, and there is no monitoring of water levels by the government. The value of resuming water level monitoring in the complex will be investigated.

3.2 Vegetation

The vegetation in the lake basin ranges from emergent aquatic types to meadows, tall shrubbery and woodland. The vegetation is related to the hydrology of the wetlands (Wallis 1995). The areas with year-round high water tables have extensive beds of cattails and bulrushes. Those areas of frequent flooding have a dense ground cover of sedges and grasses. Less frequently flooded areas, but flooded enough to limit tree establishment, are characterized by dense willow and grass communities. Upland vegetation such as aspen and balsam poplar dominate the river levees, often with dense understory of willow, red-osier dogwood and chokecherry.

The vegetation is a unique and vital component of the complex. The dense cover of sedges and grasses provide food, shelter and nesting habitat for waterfowl and shorebirds such as the yellow rail. Neotropical migrants nest in the willow/sedge areas, and the grass/sedge areas are critical winter habitat for the wood bison. The Dene Tha' traditionally have burned areas of the complex to maintain wildlife habitat.

Objectives

- *To maintain the role of fire for habitat management*
- *To control or eliminate non-native species that may threaten the native plant species and communities.*

Management Actions

A fire plan will be developed for the park. The plan will include historical information, wildfire management, and prescribed burn management, and will be developed by the Dene Tha' First Nations, Sustainable Resource Development, Forest Protection Division and Fish and Wildlife Division, and Parks and Protected Areas. The timing of prescribed burns will consider the wildlife in the area.

Invasive aquatic plants such as purple loosestrife change the ecology of a wetland. Currently these have not been found in the park. If found, efforts will be made to eliminate these and other invasive plants detrimental to the ecology of the wetlands.

3.3 Wildlife

Birds

The Hay-Zama wetland complex is a key waterfowl production, staging and moulting site on three of the four major North American flyways (Pacific, Central, and Mississippi). Thousands of ducks, geese and shorebirds rest and feed in the complex during spring and fall migrations, as it is the only productive waterfowl habitat for miles around. From data collected since 1994 (Wright 2001), the average number of ducks observed on date of peak migration is 24,342 in spring, and 45,342 in fall. Maximum numbers have been over 100,000. Average number of geese at date of peak migration (1978 to 1999) is 6,168 in spring, and 8,131 in fall.

Other birds found in the complex include gulls, terns, raptors, woodpeckers, and songbirds, which including waterfowl brings the number of observed bird species to over 100. (see Appendix 3 for bird list). Bald eagles nest in the wetland complex, as well as great horned owls. Golden eagles pass through during migration. An inventory of shorebirds is currently being conducted by the Canadian Wildlife Service (Gerry Beyersbergen – personal communication).

Avian botulism[2], a naturally occurring form of food poisoning affecting waterfowl, occurs on the Hay-Zama wetland complex and is of concern. The poison is produced when a virus infects type C Clostridium botulinum bacteria, causing the bacteria to produce a toxin. The botulism spore, or resting stage of the bacteria, is commonly found in wetland soils and can survive for years, withstanding freezing and drying. Many birds inadvertently eat these spores while feeding and the spores live in their tissues with no effect on the birds' health. When a bird dies, its decaying carcass often offers three conditions that type C botulism bacteria need to grow and produce toxin - high temperatures, protein rich material, and an absence of air.

[2] Avian botulism information is from Sustainable Resource Development, Fish and Wildlife Division and at http://www.mb.ec.gc.ca/nature/migratorybirds/avianb/dc22s00.en.html.

Botulism toxin is transferred to birds by maggots and other invertebrates that feed on the decaying carcasses. The botulism toxin does not harm the invertebrates but it accumulates in their tissues to levels where several maggots can kill a duck. Large numbers of maggots on a bird carcass can attract live birds that then become poisoned by ingesting toxic maggots. The cycle repeats itself, each time involving more and more birds.

In general, botulism outbreaks have been noticed more frequently in recent years[3]. In 2000, a cleanup operation disposed of about 60,000 dead birds, but it was estimated that waterfowl losses exceeded 100,000 (Kim Morton, personal communication). Ducks Unlimited have little evidence of botulism outbreaks in the early years of their involvement with the complex, and Dene Tha' elders do not recall such outbreaks in their past (memo from Baptiste Metchooyeah in Pat Cabezas' compilation).

Wood Bison (from Mitchell and Gates 2001)
Wood bison are a native species that, in northern Alberta, ranged the small prairies and meadows that dot the landscape. By the late 1800s, their population was reduced to a few hundred in northeastern Alberta. An estimated 1500 wood bison were believed to be in Wood Buffalo National Park (WBNP) when it was established in 1922. In 1925 diseased plains bison were transferred from Wainwright to WBNP, where they hybridized with the wood bison and passed on their diseases. In 1965, an isolated herd of bison in the northwest part of WBNP was found to be disease free and did not appear to be hybrids. Some of this herd was moved to Elk Island National Park where their numbers have increased. Since then excess wood bison from this herd have been relocated in a government sponsored program to restore wood bison to their original range.

In 1984, twenty-nine wood bison were reintroduced to the Hay-Zama area from Elk Island National Park, the only re-introduction location in Alberta. The Hay-Zama wetland complex provides suitable habitat for bison, particularly in winter when they feed on grasses and sedges. In 1995 a large portion of northwestern Alberta was designated a Bison Management Area to provide regulatory authority for managing the Hay-Zama wood bison herd. The bison are currently not hunted. Their population has grown to about 200 as of March 2001, and their range has expanded beyond Hay-Zama area.

The Hay-Zama herd may be at risk from the wood bison in and around Wood Buffalo National Park which are infected with the cattle diseases bovine tuberculosis and bovine brucellosis. Other pressures on the herd include expansion of agriculture in the boreal region, in particular commercial bison ranching, and increasing industrialization of northern parts of the province.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) lists the wood bison as 'threatened'. Within the Bison Management Area, wood bison are listed as 'endangered' in the Wildlife Act. The Status of Alberta Wild Species (2000) states wood bison as "at risk". Due to the localized populations, the Alberta Natural Heritage Information Centre ranks wood bison as S1 (ANHIC 2001)[4].

Other Wildlife
Aquatic fur-bearers such as muskrat, beaver and otter are the most common mammal, although black bear, white-tailed deer, red fox, coyotes and wolves also frequent the area. The park area is not often frequented by woodland caribou or moose.

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[3] In 1989, 6000+ lost; in 1990, 3200+ birds lost; in 1998, 4000+ birds lost (Kim Morton, personal communication).

[4] Rankings are S1 to S5, with S1 the rarest. An S ranking is a subnational, as opposed to a global, category of ranking. Wood bison may be especially vulnerable to extirpation because of some factor in its biology. (http://www.gov.ab.ca/env/parks/anhic/anhic.html)

It is an important recruitment area for northern pike (Schaffe and Wright 1997); walleye are also present.

Objectives

- *To learn more about wildlife use of the complex through surveys and research projects.*
- *To manage botulism outbreaks in an efficient, environmentally safe manner.*
- *To enforce provincial hunting and fishing regulations.*

Management Actions

Wildlife research within the wildland park will be encouraged. A number of agencies have worked in the area, including Ducks Unlimited, Alberta Conservation Association, Canadian Wildlife Service, and Fish and Wildlife Division. Parks and Protected Areas looks forward to, and will support, the continuing interest of these agencies. See Appendix 2 for list of research and monitoring projects, both past and current.

The current waterfowl monitoring program is implemented by the Hay-Zama Committee on behalf of the operators to meet the requirements of ID 96-1 and is conducted during critical waterfowl migration periods (Wright 2000, 2001). As oil and gas activity phases out in the complex, decisions regarding this monitoring program will be made by the Hay-Zama Committee.

In an aerial survey July 2001, Canadian Wildlife Service (CWS) observed over 10,000 shorebirds using the wetlands. Further surveys are planned for 2002. CWS feels Hay-Zama Wildland Park is a potential site for designation by the Western Hemisphere Shorebird Reserve Network[5]. This is a voluntary coalition of over 160 private and public organizations in 7 South and North American countries, working together to preserve shorebirds throughout their habitats. Minimal numbers for designation are 20,000 shorebirds annually, and further surveys at Hay-Zama may produce these numbers.

Fish and Wildlife Division policies concerning botulism control will be followed. For 2001, early surveillance and preventive cleanup is a priority. The limited resources available will be deployed on a priority basis. Large lakes such as Hay-Zama, particularly if in a perpetuation phase (i.e., more than 1000 carcasses, significant evidence of maggots, widespread distribution of carcasses) are a low priority. Fish and Wildlife Division is currently studying the effectiveness and cost efficiency of cleanup and disposal of bird carcasses on large lakes.

A herd of feral horses belonging to the Dene Tha'winter in the eastern end of the park. Feral horse dieoff is recurring. In 2001, Fish and Wildlife Division investigated the cause of mortality. Three samples tested positive for equine infectious anemia, and also showed liver damage caused from malnutrition. The conclusion was that mortality was the result of stress from a variety of environmental and natural factors (Morton 2001). The horses will be allowed to continue to winter in the park, but the Dene Tha' will be responsible for them.

The re-introduction of the Hay-Zama wood bison herd is part of a broad-ranging strategy to reintroduce wood bison to their original territory. Fish and Wildlife Division will continue to manage the bison to achieve this objective, as well as work with the Dene Tha' to address their concerns about the herd. The restoration of the wood bison is compatible with Parks and Protected Areas objectives, and the designation of the Hay-Zama wetland complex as a wildland park assures protection of critical wintering habitat for them. Parks and Protected Areas will support Fish and Wildlife in their management efforts.

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[5] More information about the Western Hemisphere Shorebird Reserve Network can be found at www.manomet.org/WHSRN.htm and at www.pnr-rnp.ec.gc.ca/nature/whp/whsrn/df01s00.en.html.

4.0 A Place for People

4.1 Dene Tha' First Nation

The Dene Tha' First Nation has three reserves that border the park. Their main community is Chateh in the Hay Lake Indian Reserve, about 8 kilometers outside the southeast corner of the park. The community uses the wetland complex for traditional activities.

Objectives

- *Dene Tha' will continue to use the area for traditional activities*
- *Dene Tha' will be involved in the management of the wildland park*
- *The park management plan will not supersede any treaty rights and agreements*

Management Actions

The Dene Tha' people have used the area from time immemorial for hunting, fishing, trapping, gathering, and ceremonial occasions. Their use will continue within the wildland park as before its establishment.

The Hay-Zama Wildland Park management plan will not supersede any treaty rights and agreements with the Dene Tha' First Nation.

The intent is that the Dene Tha' First Nation and Parks and Protected Areas will manage the park in a cooperative manner. The details of this cooperation will be negotiated once the management plan is approved. The Dene Tha' have expressed that they wish to be involved in any proposals or decisions about the park, and this could be part of the details to be worked out.

Traditional ecological knowledge of the area will be considered when making management decisions in the park. A Traditional Land-Use and Occupancy Study (1997) collected much of this knowledge.

The trappers' cabins, gravesites, and other sites of cultural value to the Dene Tha' that remain in the park will be protected.

4.2 Heritage appreciation

Heritage appreciation is the valuing of our natural and cultural heritage, and helping others to value it too. The intent of a wildland park is for visitors to explore and learn about heritage mainly on their own, but if resources are available heritage appreciation services could be provided. These include interpretation, environmental education, and information, and they could be presented on or off site.

Hay-Zama Wildland Park has a unique natural and cultural heritage. Its natural heritage is based on the distinctive ecology of the Hay-Zama wetland complex. The cultural heritage of Hay-Zama is based on the Dene Tha' First Nations and their long relationship to the land. This history has been documented in several studies, including the Traditional Land-Use and Occupancy Study (1997) mentioned above.

Objectives

- *To offer the opportunity to understand and appreciate the natural and cultural heritage of the park.*
- *To offer information about the park to the public*
- *To offer environmental education opportunities to schools and groups in the local area*

Management Actions

Appropriate programs or events initiated by the Dene Tha' to interpret their cultural heritage to visitors will be welcomed and supported by Parks and Protected Areas.

Natural heritage themes that could be used for interpretation include the wetland ecology of the complex, waterfowl migration, and reintroduction of bison.

If resources permit, environmental education relevant to the park could be presented to local schools.

At this point, public information about the park is scanty. Key messages to the public are the intent of a wildland park (ie. undisturbed, remote land with few visitor services). A brochure will be produced with a map and general information about the park. It will be made available at local sites, for instance the Band Office in Chateh, and the tourism information office in High Level. Developing a website focusing on the ecology of the wetland complex and its importance to wildlife will also be investigated.

There are no park signs. Consideration will be given to developing a park sign with map and general information to be installed at a suitable location.

4.3 Access/Boundaries

There is no formal access into the park. At present most access into the wetland complex is from the Hay River at Habay. An informal road follows the Hay River and the Omega River west from Habay to the Amber River.

Habay is unsuitable for permanent structures, evidenced by the resettlement of the Dene Tha' from Habay to Chateh in 1962 because of flooding. An ecological land classification study by Bentz (1994) confirms this, considering the area around Habay to be unsuitable for construction of permanent roads or buildings because of flooding, poor soil drainage, and susceptibility to frost heave.

A government road leading to Zama City cuts through the northeast corner of the park. The section inside the park is about 2.5 kilometers long, and is maintained by oil and gas companies.

Objectives

- *To investigate feasibility of developing a staging area/access to the park*
- *To identify park boundaries*

Management Actions

For now, a public access/staging area will not be developed. Traditional users and visitors familiar with the area can access it as before. Due to the difficulty of navigating within the complex, it is recommended that visitors unfamiliar with the area contact local people for advice and guidance. Parks and Protected Areas, with the Dene Tha' First Nation, will investigate the feasibility of a future access/staging area.

The boundary of the park is precisely the boundary of Area 1 of the wetland complex as defined in ID 96-1, with the exceptions of the Indian Reserves (IR) which the province cannot include in a protected area. A small portion of land in W6-R5-Tp112-NW17 and SW20 remains crown land, surrounded by the park on three sides and by IR No.209 on the east side. This land is also outside the boundary described by ID 96-1. With support from the Dene Tha' Band Council and from the Hay-Zama Committee, this land will be considered for addition to the park.

Marking the boundary of the park may be unnecessary except at key points. Industry is already familiar with the boundary as it follows the ID 96-1 boundary, and is able to identify it using GPS.

4.4 Outdoor Recreation

A wildland park is intended to provide opportunities for dispersed wilderness-type recreation activities that require few services or infrastructure.

Hay-Zama Wildland Park's unique landscape is suitable to recreational activities such as hunting, fishing, and birdwatching. The capacity of the land base to support other types of recreational activities that require more infrastructure is generally low, mainly because of frequent flooding and poor soil drainage.

Objectives

- *To provide opportunities for appropriate backcountry recreational activities*
- *To ensure visitor safety in the park*

Management Actions

There will be no extensive facility development, in keeping with the intent of a wildland park. This includes no auto accessible camping, which in any case is not suitable for the terrain in this park.

As stated in Section 4.2, there is no formal access to the park at present. Recreationists familiar with the area can access it as before. Those unfamiliar with the area are recommended to contact local people for guidance.

Most off-highway vehicle use in the park is by the Dene Tha' who live on the adjacent Indian Reserve and who use off-highway vehicles to hunt, fish and trap.. Off-highway vehicle use will continue as before park establishment, and in a manner that respects the land, and is in keeping with the intent of a wildland park to create as little disturbance as possible. In future, if off-highway vehicle use becomes a management problem, the Dene Tha' and the department will collaborate to prepare an access management plan and regulation for the wildland park.

Random camping and associated fires are allowed in the park. However, the wetland terrain is generally unsuitable for camping. There may be opportunity for a privately operated campground near the park.

Hunting and fishing are allowed in the park. All current hunting and fishing regulations are in effect, except where treaty exemption applies. Although Conservation Officers will not patrol the park regularly, periodic patrols will occur to enforce provincial and federal legislation.

Motorized watercraft that are consistent with present-day activities are allowed on the complex. Motorboat users should be mindful of creating disturbances to waterfowl, particularly in nesting season and during botulism outbreaks.

Float planes/helicopters are currently used to monitor well sites and to monitor wildlife. After the oil/gas industry has withdrawn from the park, aircraft will only be permitted for research and management purposes or in the case of emergencies.

At this point most visitors to the park are local people. If and when visitor use increases, monitoring of visitor activities and their impacts may be warranted.

4.5 Heritage tourism

Wildland parks provide a landbase suitable for nature-based tourism activities such as guiding and outfitting and nature watching.

Hay-Zama Wildland Park has potential for hunting and birdwatching tourism activities. However, it is anticipated that this potential will not be realized for several years, since the park is remote and building a tourism market takes time.

Objectives

- *To allow appropriate and safe nature-based tourism activities in the park*
- *To support local businesses and tourism groups and offer economic opportunities*

Management Actions

Guide and outfitter businesses must apply for a permit from Parks and Protected Areas to operate inside the park.

The Dene Tha' First Nation has expressed interest in participating in guiding and outfitting operations in the park. This is compatible with Parks and Protected Areas objectives to offer opportunities for commercial recreation ventures in wildland parks. Guidelines for commercial tourism operations in the park can be included in cooperative management negotiations with Parks and Protected Areas.

Development of nature tourism accommodations outside the park are appropriate.

5.0 Dispositions

5.1 Oil and gas

In the 1960s oil companies began tapping the large hydrocarbon field beneath the Hay-Zama wetlands. Various companies have owned the mineral rights in the complex since then; now 3 companies own leases on the wetlands – Ventus Energy, Husky Oil and Crispin Energy. Ventus Energy owns the majority of the leases.

IL 84-14

In 1984, this document was issued by the then land manager, Energy and Natural Resources. It directed access restrictions and set out the boundaries for those restrictions in the Hay-Zama wetland complex. The Alberta Energy and Utilities Board (AEUB) provided specific technical guidelines for production of oil and gas. The boundaries set out in IL 84-14 were superseded by the boundaries defined in ID 96-1.

ID 85-4

In 1985, interim directive ID 85-4 from the AEUB set out specific guidelines for operators proposing oil or gas developments within the Hay-Zama wetland complex. The guidelines were designed to deal with the unique environmental conditions, and resulted in the creation of the Hay-Zama Committee. This is a joint industry/government/First Nations/environment committee that guides oil and gas development in the wetland complex.

ID 96-1, MOU and Addendum 1

In 1996, ID 96-1 replaced ID 85-4. The interim directive was proposed by the Hay-Zama Committee and endorsed by the government. It defined the boundary of the Hay-Zama complex based on biological and hydrological criteria, and identified Area 1 as most sensitive to disturbance (see map on page 18). It set out special requirements for seismic, drilling and servicing, and production. A key objective was to encourage safe and rapid depletion of the oil and gas reserves in Area 1. The key accomplishment of ID 96-1 was the prohibition of surface development on mineral leases acquired within the complex after January 16, 1996.

The Memorandum of Understanding (MOU) was a document generated between Ventus Energy and the Hay-Zama Committee in September 1999. It negotiated agreements that guide the accelerated depletion of oil and gas reserves from the Hay-Zama Complex within a fixed time frame. Husky Oil and Crispin Energy participated in the creation of the MOU, and both companies endorsed it.

The Addendum #1 was a document negotiated between Ventus Energy and the Hay-Zama Committee in October 2000. It reinforces the time limitations introduced in the MOU, and deals with the concept of footprints.

Oil and Gas in Hay-Zama Wildland Park

Oil and gas commitments existing prior to the establishment of the park on March 22, 1999 will be honored. All new leases are sold with a "no surface access" provision.

ID 96-1, the MOU, and Addendum #1 will continue to direct oil and gas production in Area 1 of the wetland complex as defined in ID 96-1. The boundaries of this area are the same as the boundaries of the Hay-Zama Wildland Park, except for the portions defined in ID 96-1 that are inside Indian Reserves. Therefore ID 96-1, the MOU and Addendum #1 will direct oil and gas in the wildland park. The designation as a wildland park will not place additional restrictions on oil and gas development.

It is intended that the Hay-Zama Committee will continue to provide advice to government and oil and gas operators in the wetland complex as in the past, with the added dimension of the wetland complex now being a wildland park.

ID 96-1, the MOU, and Addendum #1 are in Appendix 1.

5.2 Trapping

Several Registered Fur Management Areas (RFMA) are in the park, and trapping will continue as before in these RFMAs. Trapping regulations administered by Sustainable Resource Development, Fish and Wildlife Division will apply as before.

Trapper's cabins are allowed in the park in association with Registered Fur Management Areas. Routine maintenance of existing cabins is permitted. Applications for the replacement of old cabins and the development of new cabins within the park will be made to Parks and Protected Areas who, along with Sustainable Resource Development, Fish and Wildlife Division and the trapper, will resolve any concerns that may arise.

Registered trapline owners will be allowed to use off-highway vehicles (ATVs and snowmobiles) to access their traplines using access routes as before.

6.0 Management Responsibilities

6.1 Hay-Zama Committee

The Hay-Zama Committee has been very successful in managing the wetland complex prior to its establishment as a Wildland Park. It is recommended that this committee continue to function as a management committee for the park. The guidance it provides to oil and gas activity in the park will

continue. As before, the committee will discuss and reach decisions dealing with park management issues by consensus. If consensus cannot be reached, the Minister of Alberta Community Development retains the final management authority for the Park.

6.2 Alberta Community Development, Parks and Protected Areas

Alberta Community Development, Parks and Protected Areas, is the government agency responsible for developing legislation and policy for parks and protected areas.

Parks and Protected Areas will negotiate with the Dene Tha' First Nations to develop a cooperative working relationship for the management of Hay-Zama Wildland Park.

6.3 Dene Tha' First Nation

Three Dene Tha' Indian Reserves are adjacent to the park. The main community is at Chateh in Hay Lake IR 209. The Dene Tha' First Nation has used the wetland complex for traditional activities for a long time. They continue to be concerned about oil and gas activity on the wetlands, and the potential impacts to the wildlife and to significant sites such as graves, cabins, historical sites or important hunting areas. They play a major role on the Hay-Zama Committee, where they advocate for the welfare of the wetland complex and of their people.

The band is participating in this management plan process, and when the management plan is approved will negotiate terms of a cooperative working relationship with Alberta Community Development for management of the park.

6.4 Alberta Sustainable Resource Development

Alberta Sustainable Resource Development, Fish and Wildlife Division will continue their involvement in the management of the wildlife of the park, for instance with avian botulism and bison management. They will continue to be involved in the Hay-Zama Committee.

Alberta Sustainable Resource Development, Forest Management Division will continue their involvement with day-to-day management of surface dispositions in the park. They are familiar with the area and with the management of dispositions, and Parks and Protected Areas appreciates their cooperation. New dispositions will be issued as per the Parks Act and ID 96-1. Reclamation of existing dispositions will consider future park needs. Alberta Sustainable Resource Development, Forest Protection Division will also continue to take the lead role in managing wildfire and controlled burn situations.

7.0 Park Zoning

Generally individual parks and protected areas are divided into zones for management purposes. The zones are based on management requirements for preservation, as well as their capability to accommodate heritage appreciation, outdoor recreation, and heritage tourism.

At this time Hay-Zama Wildland Park will not be divided into management zones. Instead, it will all be managed as a wilderness zone. In wilderness zones, protection of natural heritage values receives principal consideration. Visitor facilities will not be developed within the park. In future, if heritage tourism begins to develop in the park, consideration may be given to identifying zone(s) appropriate for these activities.

8.0 Plan implementation/review

Alberta Community Development is responsible for the implementation of this plan. First priority following plan approval is the negotiation of cooperative management with the Dene Tha' First Nations.

This plan will be reviewed not later than ten years from its date of approval. A review can be initiated sooner if requested by the Hay-Zama Committee.

References

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Appendix 1

INTERIM DIRECTIVE ID 96-1

16 January 1996
TO: All Oil and Gas Operators

HAY-ZAMA LAKE COMPLEX - SPECIAL REQUIREMENTS

This Interim Directive supersedes Interim Directive ID 85-4.
ID 85-4 sets out specific guidelines for operators proposing oil or gas developments within the Hay-Zama Lake Complex (the Complex). These guidelines were designed to recognize the unique environmental conditions within the region. A key feature of ID 85-4 was the creation of the Hay- Zama Lake Complex Committee (the Committee), a joint industry/government/public committee designed to provide advice to government and to operators within the Complex. The updating of ID 85-4 has come about largely through the recommendations resulting from the activities of the Committee.

A key change from ID 85-4 is the development of new boundaries for the Complex. Unlike the previous boundaries, which were drawn in a conservative and somewhat arbitrary fashion using township/range coordinates, the new boundaries (Attachment 1) are based on biological and hydrological criteria. As a result, these boundaries more clearly define the wetland area and vegetation of the Complex most sensitive to impacts from oil and gas development.

This Interim Directive (ID) also expands and refines the special provisions for seismic operations, drilling, production, and pipeline construction and operation in both Area 1 and Area 2 of the Complex (Attachment 2). The various provisions have been modified and new requirements added in light of acquired field experience since the issuance of ID 85-4.

The general operating philosophy has also been changed for future developments within the Complex. The Complex is one of North America's largest and most important staging areas for migratory birds. While development within the Complex has to date been carried out without serious incident, the risk of significant environmental impact from a spill or blowout remains and may be increasing as the facilities continue to age. This is particularly true for wells located within the actual wetlands portion of the Complex. Therefore, a key objective of this ID is to encourage the rapid and safe depletion of any reserves being drained by wells within Area 1 (Attachment 1) and the timely abandonment of any associated well bores, while still providing companies with a reasonable opportunity to develop their mineral leases. All future mineral leases sold within Area 1 will stipulate that no surface access will be allowed. As a result, no surface development on new mineral leases within Area 1 will be permitted. For all future mineral leases sold within Area 2, a 100 metre buffer from Area 1, due to the proximity to open water, must be observed for any new surface activity, but expedited reservoir depletion will not be required.

For existing but as yet undeveloped mineral leases within the Complex, surface access for drilling, production facilities, and pipelines may be allowed. However, operators proposing any new development within Area 1 should note the following:

1. Mineral surface leases for new surface access may have significant timing, design, and/or location restrictions, as per the addenda to existing mineral lease agreements. A detailed review

by Alberta Environmental Protection (AEP) of any request for new surface access to Area 1 in particular should be anticipated.

2. Any proposed new development within the Complex, and particularly Area 1, may be subject to federal environmental review under the Canadian Environmental Assessment Act. A detailed environmental and technical assessment by provincial authorities of any new development should also be expected. Proponents are also expected to follow normal public consultation processes including contacting and discussing proposed new developments within Area 1 with the Dene Thà First Nation, prior to submitting an application to the EUB.

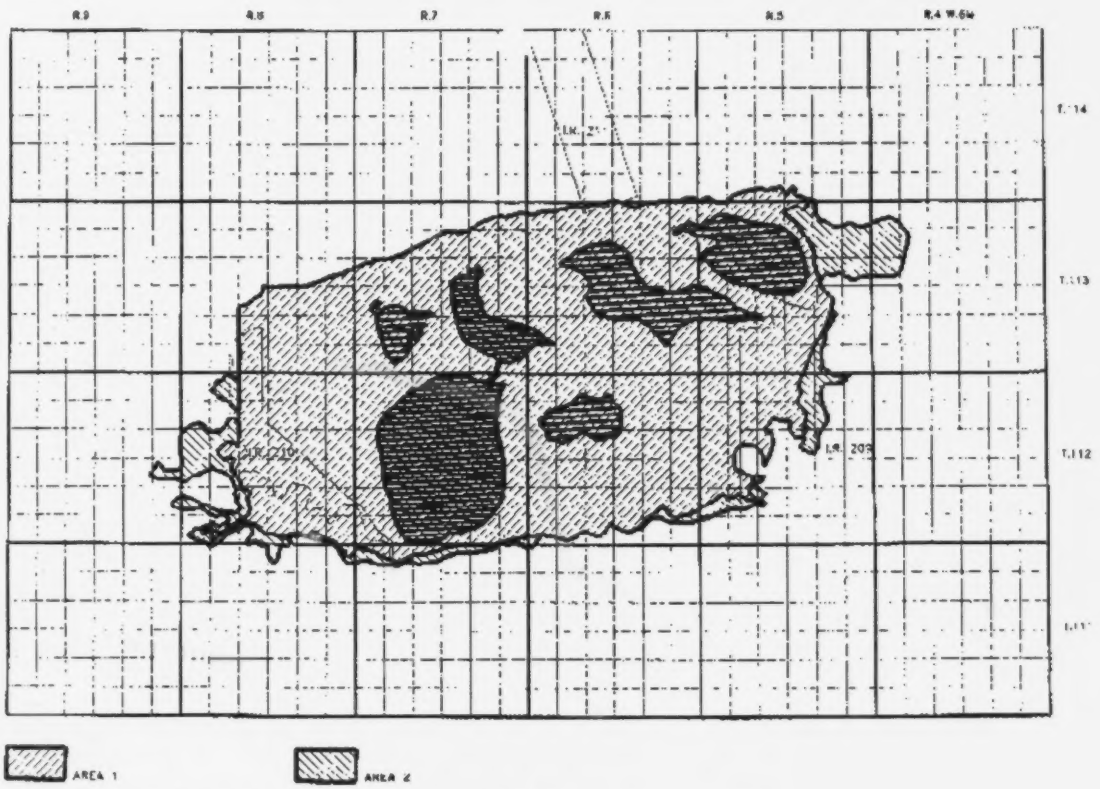
For existing well sites within Area 1, any activities by operators to more rapidly drain reserves (e.g. recompletions, horizontal wells) will be encouraged, provided these operations are conducted as per the operating provisions of this ID and in accordance with good engineering and production practices. As noted above, expedited drainage will not be required for wells within Area 2.

To further encourage the timely depletion of reserves within Area 1, as well as to provide protection for the Orphan Abandonment Fund, the EUB will require operators to submit, within ninety (90) days of the issuance of this ID, a proposed operational plan for all producing and suspended wells. This plan should provide: the operator's best estimate of reserves for each well; an estimate of the remaining life of each well and facility; plans for the development of all undrilled mineral leases; plans for recompletion or workover of any wells; plans to accelerate depletion of reserves; plans for any associated surface facilities and/or pipelines; plans for the timely abandonment and reclamation of any wells, pipelines, and facilities which have no further productive life or potential; and any operational, economic, or other barriers to expediting the rapid depletion of reserves.

Operators will be required to update the EUB of any significant changes to this plan every two years. In addition, operators are expected to abandon any wells which have been suspended for more than 24 months following the issuance of this ID, unless an extension to the period of suspension has been obtained from the EUB. Any justification for continued suspension of the wells can be included in the plan identified in the above paragraph. Companies which fail to provide the plans described above by the scheduled dates will be required to abandon existing wells within Area 1.

For further information on this ID, contact the EUB's Edmonton field office, telephone (403) 460-3800. For information on seismic operations, contact AEP's Edmonton office, telephone (403) 427-8474.
<signed by>
Brian F. Bietz
Board Member
Alberta Energy and Utilities Board
and
Cliff Henderson
Assistant Deputy Minister
Alberta Environmental Protection
and
David Smith
Assistant Deputy Minister
Alberta Energy
attachments

ATTACHMENT 1 - Map showing area



ATTACHMENT 2

HAY-ZAMA LAKE COMPLEX - SPECIAL REQUIREMENTS

For seismic, drilling, and production operations in the Hay-Zama Lake Complex (the Complex), identified as Areas 1 and 2 in Attachment 1, the following special requirements are in addition to the requirements of the Oil and Gas Conservation Regulations and of AEP. Unless otherwise noted, all information required by the EUB should be sent to the Edmonton field office.

1 SEISMIC OPERATIONS

1.1 Approval of all seismic operations is required from AEP.
1.2 All seismic operations will be conducted with non-explosive surface sources.

2 SPECIFIC DRILLING AND SERVICING REQUIREMENTS

2.1 Before drilling into the top of the Zama Member, the operator must run intermediate casing.
2.2 The intermediate casing is to be cemented full length.
2.3 The surface casing vent shall remain closed except during monthly checks for pressure in the surface casing. The results shall be recorded and retained on file for 2 years. These results shall be submitted to the EUB on request.
2.4 If a blowout occurs, the EUB and AEP shall be notified immediately. If it appears that oil will reach the lake water before the flow of oil can be stopped, the EUB may require ignition of the oil and/or well.
2.5 All waste generated shall be managed in accordance with the EUB "Recommended Oilfield Waste Management Requirements".
2.6 All drilling fluids, shale, oil, salt water, other well effluent, and oily or chemical refuse must be contained in steel tanks and trucked to off-site disposal locations approved by AEP.
2.7 Suitable pits to contain all drilling fluids shall be constructed at off-site disposal locations designated by AEP. On completion of drilling, the pits shall be filled and the off-site disposal location restored to the satisfaction of AEP.
2.8 The lease shall be adequately diked to prevent the accidental escape of fluids.
2.9 The EUB must be notified at least 48 hours prior to any well work requiring the use of a service rig or wireline unit.
2.10 Upon completion of drilling or servicing operations, the surface on which the equipment was located shall be thoroughly cleaned to ensure that no contaminants are left on the site. All scrapings shall be hauled to an off-site disposal location approved by AEP.
2.11 All lease areas and off-site disposal locations must be cleaned up to the satisfaction of an officer of AEP prior to 31 March in any year, unless the deadline is extended by AEP having regard to weather conditions and terrain.
2.12 When servicing a well on ice, operators shall cover the total area to be used for that operation with earth or sand to a depth of at least 10 centimetres to absorb any accidental spills during the operation. Upon application, the EUB may approve an alternative method to absorb accidental spills during servicing operations. At the completion of operations, all earth, sand, or other absorbent materials will be removed from the lease and disposed of in a location approved by AEP.
2.13 Existing wells in Area 1 must be enclosed in an adequate caisson at least 331.5 metres above sea level. Wells which are not completed are to be equipped with an attached wellhead. Completed wells must be equipped with a tubing valve or plug and the wellhead left in place. Section 3 to this Interim Directive defines further requirements.
2.14 Existing wells in Area 1 not drilled from a pad or not enclosed in a caisson at least 331.5 metres above sea level, and not completed, must be capped at lake bottom to prevent ice damage during spring breakup. If completed, the well must be suspended using a bridge plug capped with cement set above the perforations. The wellhead must be removed and the well capped at lake bottom.

3 SPECIFIC PRODUCTION REQUIREMENTS

Well Sites, Batteries, Gas Plants, Compressor Stations, and Satellites

3.1 The operation of all automatic controls shall be tested manually once per month and the results of the test recorded. Test results shall be retained for 2 years and made available to the EUB on request.
3.2 There shall not be more than one battery per quadrant of the township unless otherwise approved by the EUB.
3.3 The surface elevation of the pad upon which producing wells or production facilities are located shall be a minimum of 331.5 metres above sea level.
3.4 The entire facility or well site, including flare pits, pipeline pumps, and truck-loading facilities, shall be adequately diked and contoured to prevent the accidental escape of fluids.

3.5 Batteries, gas plants, compressor stations, and satellites are to be checked at least once per day by the operator.
3.6 During production periods wells must be patrolled daily, unless weather conditions make this impossible.
3.7 Storage facilities shall meet the EUB "Storage Requirements for the Upstream Petroleum Industry". Storage tanks shall be equipped with an automatic high-level liquid shutoff.
3.8 All wells that are not accessible at all times (includes all wells located on the water) must have a remote shut-in system approved by the EUB.
3.9 All wells shall be suitably protected to prevent ice damage.
3.10 All wells with the ability to flow shall be equipped with

- a production packer set as closely above the producing formation as is practical to isolate the tubing and production casing, and
- a valve installed in the tubing of the well, and at a minimum depth of 30 metres below the surface or such other depth as the EUB may prescribe, that may be controlled from the surface and which will close automatically in the event of an uncontrolled flow of oil or gas, or a failure in the system that operates the valve.

3.11 All pumping wells must be equipped with

- pressure shut-offs set so pumping will be stopped before there is a danger of stuffing- box failure,
- a suitable deflection device to minimize spray in the case of a stuffing-box failure, and
- a production blowout prevention device that will shut off any flow from the well in the event of a rod failure.

Dikes

3.12 The capacity of the dike surrounding the liquid storage tanks shall exceed that of the tanks by at least 20 per cent.
3.13 The dike walls shall be constructed of suitable impermeable material and compacted when built.
3.14 No drain line shall penetrate the dike.
3.15 The area within the dike shall be graded to one corner so that any oil spilled, or other fluids, will collect there and be readily pumped out.

Process Vessels

3.16 Process vessels shall be equipped with automatic high liquid level and high pressure shut- offs and shall be housed and heated.
3.17 Outlets from pressure relief devices shall discharge to a tank of a capacity adequate to contain all production that may occur during the period the equipment is unattended. Upon application, the EUB may approve an alternative spill control system.

Pipelines

3.18 The licensed maximum pipeline operating pressure shall be such that it induces a hoop stress in the pipe not greater than 0.50 times the specified minimum yield strength of the pipe.
3.19 Prior to the start of operations, all pipelines shall be field tested with water or another test medium approved by the EUB to a pressure of 1.4 times the maximum operating pressure or 7000 kilopascals, whichever is greater, for a period of 24 hours.
3.20 All pipeline welds shall be radiographically inspected.
3.21 Check values shall be installed in the headers at each battery.
3.22 Continuous external and internal corrosion protection for all pipelines is required. The cathodic protection systems must be checked weekly and the protection levels recorded and retained for 2 years. An annual adjustive survey is required. Results of this survey shall be submitted to the EUB on request.

3.23 All pipelines must be equipped with a high and low pressure shut-down system approved by the EUB.
3.24 To confirm the integrity of each pipeline, an annual leak test must be conducted at the maximum operating pressure of the pipeline using the fluid being transported as the test medium. Test results shall be recorded and retained on file. If pressure test charts or other records are not available to confirm that the annual tests have been conducted, the pipelines will be tested as soon as possible to 1.4 times the maximum operating pressure for 24 hours using fresh water or other EUB-approved test medium.

Flare Pits and Flare Stacks

3.25 Flare pits will continue to be acceptable, provided there is virtually no probability of produced liquids entering the pit. All flare pits will be lined with a suitable impermeable liner. The use of suitable tankage (i.e. rig tanks) and/or a ground-level incineration system is recommended.
3.26 The excavation of the flare pit shall be kept to a minimum in order to avoid penetrating the water table.
3.27 Any liquids released or dumped (accidental or otherwise) in the flare pit will be disposed of outside the Complex immediately.
3.28 All stock tank vapours shall be conserved or burned in accordance with requirements outlined.
3.29 The flare system shall be equipped with a suitably-sized liquid knockout and high liquid control system.
3.30 Gas lines to the flare system shall be equipped with a flame arrestor.
3.31 The flare system will be equipped with a continuous ignition device.

4 GENERAL DRILLING AND PRODUCTION REQUIREMENTS

4.1 An oil spill contingency plan shall be updated annually and approved by the EUB. Operators shall be prepared to take immediate corrective measures in the event of a spill.
4.2 Any accident resulting in the escape of oil, well servicing fluids, or produced water shall be immediately reported to the EUB Edmonton field office and the AEP High Level district office.
4.3 During a 5-week spring period (commencing mid-April) and a 8-week fall period (commencing mid-August) each year, the company shall:

- suspend well production and helicopter operations, or
- AEP and operators within the Complex will monitor fish and wildlife activity in the Complex and, in consultation with the Fish and Wildlife Division of AEP, determine for which wells, if any, suspension of production and helicopter operations is required and for what period of time.
- Suspension of operation shall include:
    - consultation with the EUB to establish appropriate shutdown procedures and sequences,
    - shutting in the wells, and
    - depressurizing all pipelines and vessels.

4.4 All wells, batteries, compressor stations, satellites, and pipeline routes shall be patrolled within 24 hours of production being suspended.
4.5 For the period between mid-April to approximately mid-July each year, construction of roads, pipelines, etc with respect to stream and river crossings will be suspended to accommodate fish spawning and migration. The exact dates will be set by the Fish and Wildlife Division of AEP.
4.6 Trucking of oil, produced water, or well servicing fluids must be kept to an absolute minimum. Under no condition shall oil be trucked from outside the area to a shipping point inside the area. If oil must be used for well servicing, prior approval must be obtained from the EUB.

Memorandum of Understanding
Hay-Zama Lakes Oil and Gas Development

The Hay-Zama Lakes Complex is an internationally recognized wetland Complex that has recently been designated a Wildland park by the Alberta Government. The Hay-Zama Lakes Complex is also a culturally significant place to the Dene Tha' First Nation.

Following extensive consultation with the public, government, industry and Dene Tha' First Nation, the Hay-Zama Committee has agreed to a development plan presented by Ventus Energy Ltd. (Ventus) for the continued operation and development of oil reserves with in Area 1 of the Hay-Zama Lakes Complex ("the Complex"). The agreement encompasses all of Ventus' petroleum and natural gas leases with in the Complex boundaries.

The operational/development plan is designed to phase out production in areas considered by all stakeholders to be the most environmentally sensitive and increase production from areas with less environmental sensitivity. The objective of the plan is in line with ID 96-1 as it will significantly reduce the period of time oil operations are conducted on the Complex.

In overview, the agreement has three main conditions.

1) The operator will cease all oil and gas production operations in Twp 112 Rge 7 W6M by the end of 2004. No new wells will be drilled.
2) The operator will cease all oil and gas production operations in Twp 113 Rge 7 W6M by the end of 2004, provided that satisfactory compensation can be negotiated with the crown. Should satisfactory compensation not occur, the operator will cease all oil and gas production by the end of 2009. No new wells will be drilled.
3) The operator will cease all oil production operations in Twp 112 Rge 6 W6M by the end of 2012 with the provision that any well still producing at that time will have up to an additional 5 year production period, if the well is economic and the safety/environmental record of the operation is intact. Development will be allowed in this area to accelerate production of existing reserves.

In addition to the above conditions, the operator and the Hay/lama Lakes Committee will commit to the following:

1. Compensation

Members of the Hay--Zama Committee including Ducks Unlimited, Dene Tha' First Nation, and AWA will petition the Alberta Govemment to consider the following options in the best interest of preserving and protecting the environmental significance of the Hay-Zama Lakes Complex:

1) Swap of mineral rights
2) Compensation for resources in exchange for early exit from the Complex
3) No future sale of the mineral rights.

2. Abandonment Plan

Ventus will present an abandonment plan to the Hay-Zama Committee and AEUB by May 31, 2000. The plan will include the expected abandonment schedule for Ventus wells and infrastructure on the complex. The operator will be required to update the plan every 2 years.

3. Operations Status Presentations

The operator will present a summary of field operations and project status twice per year to the Hay-Zama Committee. The presentations will be timed for the May-June period to include the results from the past winters operations and the August-September period to outline the plans for the upcoming winter operations.

4. Future Operatorship/Ownership

Should Ventus dispose of the property, the acquiring party will be made aware of the conditions of operation Ventus has committed too, and the party will be required to operate the property under those conditions.

5. Field Electrification

Ventus is currently evaluating the options to electrify the central facility and certain wellsites. Two options currently exist:

1) Bring power to the site from ATCO power via a transmission line from outside the Complex
2) Generate power at the site if sufficient sweet gas is available.

Ventus currently supports option 2 as we believe the proposed 8-33 Bluesky well will be able to supply gas to generate power. Option 1 is less desirable due to the disturbance overhead power lines would cause to flying, both birds and helicopters.

6. Installation of Electric Submersible Pumps

The operator will review all wells for the suitability of lifting fluid with ESP's. On lower rate wells ESP's are not practical or economic to operate.

7. Field Telemetry

Ventus is currently evaluating the merits of using telemetry to reduce the usage of helicopters and provide 24 hr monitoring of producing wells. Ventus will utilize telemetry if feasible.

By signing this agreement, all parties agree to allow Ventus to proceed with this winters development plan to refine reserve estimates and be in a position to provide a more definite development and abandonment plan.

Signed September 27, 1999 Edmonton, Alberta, Canada

Jim Broughton, Ventus Energy
Ron Millson and Pat Cabezas, Co-Chairs, Hay-Zama Committee
Chief James Ahnassay, Dene Tha' First Nation
Cliff Wallis, Alberta Wilderness Association
Ken Lumbis, Ducks Unlimited Canada

Memorandum of Understanding
Hay/Zama Lakes Oil and Gas Development
Addendum #1

This addendum to the existing MOU signed Sept 27,1999 is a result of continued consultation between Ventus Energy Ltd., area stakeholders and the Hay--Zama Committee. The addendum is required to reflect the current development plans of Ventus on the Complex and the concerns of stakeholders on development.

Ventus' development plan for the winter of 2000/2001 as approved by the Hay--Zama Committee will consist of the following operations:

1) Drill 6 Bluesky gas wells from new surface sites in Twp 112 Rge 6 W6M. No additional surface sites will be required to produce the Bluesky gas reserves within Area 1
2) Drill 1 Bluesky gas well from an existing site in Twp 112 Rge 6 W6M.
3) Drill 4 Keg River oil wells from existing sites in Twp 112 Rge 6 W6M.
4) Drill 1 re-entry Keg River oil well from an existing site in Twp 112 Rge 6 W6M.
5) Install facilities/pipelines as required to place the wells on production.
6) Abandon 2 suspended wells in Twp 112 Rge 7 W6M.

Other operations including well servicing, pipeline integrity testing and facility modifications will also occur.

In addition to the above, Ventus has committed to the following:

1) Complete all drilling within 3 years (winter 2002/2003). A 2 year extension will be allowed for unanticipated delays, including but not limited to, weather, economic/equipment or regulatory issues.
2) Requesting a modification from the AEUB to relax the requirement of daily patrolling for the Bluesky gas wells per ID 96-1. This modification will reduce helicopter traffic in the area and reduce the disturbance of wildlife.
3) Cease production from 3 sites in 2003 and one site in 2006 in Twp 113 Rge 7 W6M.
4) Cease production from 4 sites in Twp 112 Rge 6 W6M prior to 2012.
5) Participate in negotiations with the Crown for compensation for an earlier withdrawal from Twp 113 Rge 7 W6M.
6) With respect to new surface sites, Ventus anticipates up to 2 are required for additional Keg River Oil wells. As agreed to with the Hay-Zama Committee, Ventus may required a formal hearing with the AEUB to have the locations approved. These 2 additional sites would represent the total number of new surface well sites Ventus would require for Keg River oil development within Area 1.

By signing this agreement, all parties agree to allow Ventus to proceed with this winter development plan.

All parties agree that the current MOU and addendum will not affect in anyway, nor supercede any and all Treaty and Aboriginal Rights of the Dene Tha' First Nation.

All parties agree that a letter will be sent to the Province of Alberta detailing the issues surrounding industrial activity on the Hay-Zama Lakes Complex. The issues include, but are not limited to, the future disposition of P&NG rights to successor companies of Ventus Energy Ltd., and the potential for compensation from the Provincial Government for an earlier completion (prior to 2017) of oil and gas activity on the Complex.

Jim Broughton Ventus Energy Ltd	Pat Cabezas / Ron Millson Hay-Zama Lakes Committee Co-chairs	Chief James Ahnassay Dene Tha' First Nation

Cliff Wallis Alberta Wilderness Association	Ken Lumbis Ducks Unlimited

Crispin Energy Inc.

Memorandum of Understanding
Hay/Zama Lakes Oil and Gas Development

The Hay/Zama Lakes Complex is an internationally recognized wetland Complex that has recently been designated a Wildland park by the Alberta Government. The Hay/Zama Lakes Complex is also a culturally significant place to the Dene Tha' First Nation.

Following consultation with the public, government, industry and Dene Tha' First Nation, the Hay/Zama Committee has agreed to a development plan presented by Crispin Energy Inc. ("Crispin") for the continued operation and development of oil reserves within Area 1 of the Hay/Zama Lakes Complex (the "Complex"). The agreement encompasses all of Crispin's petroleum and natural gas leases within the Complex boundaries.

The operational/development plan is designed to expediently phase out production in areas considered to be the most environmentally sensitive in a time effective and commercially viable fashion giving regard to the concerns of all stakeholders. The objective of the plan is in line with the Management Plan for the Hay Zama Wildland Provincial Park which includes EUB ID 96-1, as it will significantly reduce the period of time oil and gas operations are conducted in the Complex.

In overview, the agreement has the following main conditions:

1. The operator will be permitted to tie-in the Crispin Sousa 03-36-112-06W6M well to the Crispin Sousa oil battery at 13-09-112-05W6M during the 2001-2002 winter drilling season and shall be successful in doing so. An on-site Environmental Manager will be employed. The pipeline will employ high and low pressure shutdowns, and Crispin will continue to comply with all existing regulations regarding pipeline integrity testing and monitoring.

2. The operator will cease all oil and gas production operations in the Complex by the end of **2006**, provided that satisfactory compensation can be negotiated with the Crown.

3. Should compensation satisfactory to Crispin not occur Crispin will, subject to the conditions below, cease all oil production in the Complex by the end of 2010, with the exception of 14-33-112-05W6M which shall cease oil production in 2008. The operator will cease all oil and gas production operations in the Complex by the end of **2012. Development should be allowed to accelerate the economic production of reserves.**

4. Crispin will continue to operate within the Hay Zama Wildland Provincial Park and the Overlap Area as per the standards dictated by the Management Plan of the Wildland Park which includes EUB ID 96-1.

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In addition to the above conditions, the operator and the Hay/Zama Lakes Committee should commit to the following:

1. Compensation

If the members of the Hay Zama Committee including Ducks Unlimited, Dene Tha' First Nation, AWA and/or the Province of Alberta deem necessary to cease operations due to environmental and/or cultural issues, the Hay Zama Committee will petition the Alberta Government to consider the following options in the best interest of preserving and protecting the environmental significance of the Hay/Zama Lakes Complex:

a. Swap of mineral rights
b. Compensation for resources in exchange for early exit from the Complex
c. No future sale of the mineral rights

2. Abandonment Plan

Crispin will present an abandonment plan to the Hay/Zama Committee and AEUB by October 31, 2002. The plan will include the expected abandonment schedule for Crispin wells and infrastructure on the complex. The operator will be required to update the plan every 2 years.

3. Operations Status Presentations

The operator will present a summary of field operations and project status twice per year to the Hay/Zama Committee. The presentations will be timed for the May and October periods and will recap the previous 12 months of activity and any proposed activity for the subsequent drilling period.

4. Future Operator ship/Ownership

Should Crispin dispose of the property, the acquiring party will be made aware of the conditions of operation Crispin has committed too, and the party will be required to operate the property under those conditions.

5. Field Telemetry

Crispin is currently evaluating the merits of using telemetry to reduce the usage of helicopters and provide 24hour monitoring of producing wells. Crispin will utilize telemetry if feasible.

By signing this agreement, all parties agree to allow Crispin to proceed with the proposed pipeline development plan.

Signed March 05, 2002 Calgary, Alberta, Canada.

Crispin Energy Inc.
William Bradley

Alberta Wilderness Assoc.
Cliff Wallis

Dene Tha's First Nations
Chief Stephen Didzena

Hay/Zama Lake Committee
Co-Chair: Ken Zurfluh

Hay/Zama Lake Committee
Co-Chair: Stephen Didzena

Hay/Zama LakeCommitte
Co-Chair: Pat Cabezas

Ducks Unlimited
Ken Lumbis

Appendix 2

Research activities in Hay-Zama Wildland Park

Note: This is only a partial list.

Beyersbergen, Gerry (personal comm.) 2001 Canadian Wildlife Service conducted aerial surveys at Hay-Zama for shorebirds in 2001. On July 24, 2001 over 10,000 shorebirds were recorded. Plans are to conduct aerial surveys in spring 2002.

Calverly, A.J., D.A. Young, and B.T Gray. 1993 Hay-Zama Lakes complex waterfowl monitoring program 1993. Calgary: Prepared by Environmental Management Associates for Zama Holdings Ltd.

Fearon, P.W. and G.I. Larson. 1986 Hay-Zama Lakes survey report. Edmonton: Ducks Unlimited Canada.

Moller, K. and J. Rosin. 1994 Preliminary investigation of pike spawning potential on the Hay-Zama Wetland complex. Unpublished report. Peace River: Alberta Environmental Protection.

Morton, Kim 2001 *Band-owned Feral Horses on Hay-Zama Complex: Multi-mortality Occurrences Feb-April 2001.* High Level, Alberta: Natural Resources Service.

Saxena, A., J.A. Bentz and D. O'Leary. 1994 Biophysical Inventory of Shoreland Areas Hay-Zama Lakes, Alberta. Edmonton: Geowest Environmental Consultants.

Schaffe, C.M. and K.D. Wright 1997 Hay-Zama Lakes Biological Study. Unpublished report. Peace River: Alberta Environmental Protection.

Wright, K.D. 1997 Hay-Zama complex fisheries and wildlife monitoring 1996/97. Unpublished report. Peace River: Alberta Environmental Protection.

Wright, K.D. 1998 Hay-Zama complex fisheries and wildlife monitoring 1997/98. Unpublished report. Peace River: Alberta Conservation Association.

Wright, K.D. 1999 Hay-Zama complex wildlife monitoring 1998/99. Unpublished report. Peace River: Alberta Conservation Association.

Wright, K.D. 2000 Hay-Zama complex wildlife monitoring 1999/2000. Unpublished report. Peace River: Alberta Conservation Association.

Wright, K.D. 2001 Hay-Zama complex wildlife monitoring 2000. Unpublished report. Peace River: Alberta Conservation Association.

Wright, K.D. and Markiewicz Wood Bision Habitat Mapping Project

Appendix 3

List of birds observed in Hay-Zama Wildland Park

This list is taken from Wright (1997), Bentz et.al. (1994), Gerry Beyersbergen, Canadian Wildlife Service (personal communication) and Kim Morton, Fish and Wildlife Division (personal communication).

Loons/grebes
Pied-billed grebe
Horned grebe
Eared grebe

Waterfowl (swans, geese and ducks)
Trumpeter swan
Tundra swan
Canada goose
Greater white-fronted goose
Snow goose
Mallard
Northern pintail
Northern shoveller
Blue-winged teal
Canvasback
American widgeon
Scaup
Ruddy duck
Gadwall
Redhead
Common goldeneye
Bufflehead
Green-wing teal
Cinnamon teal
Ring-necked duck

Hawks and falcons
Bald eagle
American kestrel
Peregrine falcon
Red-trailed hawk
Northern harrier
Northern goshawk
Sharp-shinned hawk

Herons and Allies
American bittern

Cranes and Allies
American coot
Sora
Yellow rail

Shorebirds and Gulls
American avocet
Killdear
Lesser yellowlegs
Solitary sandpiper
Spotted sandpitper
Common snipe
Franklin's gull
Bonaparte's gull
Ring-billed gull
Herring bull
Common tern
Black tern

Owls
Boreal owl
Great grey owl
Short-eared owl
Great horned owl

Perching Birds
Hairy woodpecker
Downy woodpecker
Yellow-bellied sapsucker
Northern flicker
Alder flycatcher
Least flycatcher
Western wood pewee
Eastern phoebe
Eastern kingbird
Tree swallow
Barn swallow
Cliff swallow
Gray jay
Black-billed magpie

American crow
Common raven
Black-capped chickadee
Ruby-crowned kinglet
Winter wren
Swainson's thrush
Hermit thrush
American robin
Brown-headed cowbird
Red-winged blackbird
Rusty blackbird
Brewer's blackbird
Red-eyed vireo
Warbling Vireo
Black and white warbler
Orange-crowned warbler
Tennessee warbler
Yellow warbler
Yellow-rumped warbler
Magnolia warbler
Bay-breasted warbler
Blackpoll warbler
Palm warbler
Ovenbird
Northern waterthrush
Common yellowthroad
Wilson's warbler
Canada warbler
American redstart
Rose-breasted grosbeck
Savannah sparrow
White-crowned sparrow
White-throated sparrow
Chipping sparrow
Clay-colored sparrow
Song sparrow
Lincoln's sparrow
Swamp sparrow
Fox sparrow
Dark-eyed junco
Purple finch